ABSTRACT OF THE DISCLOSURE

In a proton exchange membrane fuel cell assembly, a plurality of bores is provided in each anode plate and each cathode plate at a standard distance from the active area of each plate. The bores in the anode plate are stepped. Non-conductive stepped pins, each having a well in a large-diameter portion thereof, are inserted concentrically into the bores of adjacent anode and cathode plates to form a bipolar plate subassembly. The pins extend through the bipolar plate subassembly and have a reduced-diameter portion for engaging the wells of adjacent pins in an adjacent bipolar plate subassembly. Preferably, bores and pins are provided in rotational symmetry near opposite edges of each plate. The pins thus both align an anode and cathode to form a bipolar plate subassembly and also align a plurality of bipolar plate subassemblies, in combination with a plurality of proton exchange membranes therebetween, to form a fuel cell stack having all anode plates accurately aligned with all cathode plates.

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